UNITED STATES PATENT AND TRADEMARK OFFICE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte KIRA STERLING ATTWOOD,
LINWOOD HUGH OVERBY JR.,
and CHIEN-EN SUN

_____

Appeal 2008-006155
Application 09/503,608
Technology Center 2400

_____

Decided: June 28, 2010

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Before JAMES D. THOMAS, CAROLYN D. THOMAS, and
STEPHEN C. SIU, *Administrative Patent Judges.*

C. THOMAS, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1-6 and 9-14. Claims 7 and 8 are canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

According to Appellants, the invention relates "to defending against attacks to networks by malicious users who attempt to disable a server by flooding the server with connectionless datagrams" (Spec. 1:7-10).

Claim 1 is illustrative:

1.   A method of preventing a flooding attack on a network server in which a large number of connectionless datagrams are received for queuing to a port on the network server, comprising:

determining, in response to the arrival of a connectionless datagram from a host for a port on the network server, if the number of connectionless datagrams already queued to the port from the host exceeds a prescribed threshold;

discarding the datagram, if the number of connectionless datagram already queued to the port from the host exceeds the prescribed threshold; and

queuing the connectionless datagram to a queue slot of the port, if the number of connectionless datagram already queued to the port from the host does not exceed the prescribed threshold.

Rejections

Claims 1, 3, 5, and 14 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Schuba (US 6,725,378 B1, Apr. 20, 2004).

Claims 2, 4, 6, and 9-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schuba and Yavatkar (US 6,735,702 B1, May 11, 2004).

GROUPING OF CLAIMS

(1) Appellants argue claims 1, 3, 5, and 14 as a group on the basis of claim 1 (App. Br. 9). We select independent claim 1 as the representative claim. We will, therefore, treat claims 3, 5, and 14 as standing or falling with representative claim 1.

(2) Appellants argue claims 2, 4, and 6 as a group on the basis of claim 2 (App. Br. 19). We select dependent claim 2 as the representative claim. We will, therefore, treat claims 4 and 6 as standing or falling with representative claim 2.

(3) Appellants argue claims 9 and 12 as a group on the basis of claim 9 (App. Br. 26). We select dependent claim 9 as the representative claim. We will, therefore, treat claim 12 as standing or falling with representative claim 9.

(4) Appellants argue claims 10 and 13 as a group on the basis of claim 10 (App. Br. 31). We select dependent claim 10 as the representative claim. We will, therefore, treat claim 13 as standing or falling with representative claim 10.

(5) Appellants separately argue claim 11. (App. Br. 34-35).

See 37 C.F.R. § 41.37(c)(1)(vii). *See also In re Young*, 927 F.2d 588, 590 (Fed. Cir. 1991).

FINDINGS OF FACT (FF)

Schuba Reference

1a.   "SYN flooding arises when an attacker sends many Transmission Control Protocol (TCP) connection requests, each initiated with a 'SYNchronize' (also called SYN) packet, to a victim's machine" (col. 1, ll. 34-37). "The preferred embodiments of the present invention include an active monitor that performs a process to reduce service degradation caused by SYN flooding" (Schuba, col. 3, ll. 6-8).

1b.   Schuba discloses that "[t]here is a limit on the number of concurrent TCP connections that can be in a half-open connection state, called the SYN-RECVD state (i.e., SYN received). When the maximum number of half-open connections per port is reached, TCP discards all new incoming connection requests until it has either cleared or completed some of the half-open connections." (Schuba, col. 4, ll. 52-60).

1c.   Schuba discloses that "an ACK packet is sent for suspect source addresses to free resources of the destination hosts 54 by removing connections from a half-open backlog queue" (Schuba, col. 11, ll. 19-21).

Yavatkar Reference

2a.   Yavatkar discloses "[p]roactive environment 100 configures service object 300 . . . ." "For example, one set of permissioning may allow agent 110 to use service object 300 to . . . alter settings for the port . . . ." (Yavatkar, col. 12, ll. 29-33).

2b.   Yavatkar discloses that "[t]he system and method ... of the present invention uses agents-mobile software modules - to collect data on the state of a network during a network attack" and (2) "[w]hen used herein, an agent is a software module having the capability to move from node to node on a network and to execute on the nodes to which it moves." (Yavatkar, col. 3, ll. 25-40).

PRINCIPLES OF LAW

In rejecting claims under 35 U.S.C. § 102, "[a] single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation." *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1375 (Fed. Cir. 2005) (citing *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1565 (Fed. Cir. 1992)).

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). If the Examiner's burden is met, the burden then shifts to the Appellants to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

ANALYSIS

Claims 1, 3, 5, and 14

Issue 1: Did the Examiner err in finding that Schuba teaches
(1) determining a number of connectionless datagrams already queued at a
port; (2) discarding connectionless datagrams at a port; and (3) queuing
connectionless datagrams at a port?

Appellants argue their invention is not anticipated by Schuba because
"*Schuba* does not teach anything regarding determining the number of
connectionless datagrams queued at a port or discarding or queuing the
number of connectionless datagrams at a port" (App. Br. 14). Appellants
contend Schuba, instead, "teaches determining the number of half-open
connections at a port," and "[t]he two features are entirely distinct"
(*Id.*).

The Examiner finds that "[h]alf-open connections are a queue of
connectionless datagrams" (Ans. 8). The Examiner further finds "a
connectionless datagram is equivalent to the half-open connection because it
consists of an [] IP datagram which is by definition connectionless []." (Ans.
9). We agree with the Examiner.

In essence, Appellants argue that Schuba's half-open connection state
is not the same as the claimed "connectionless datagrams already queued to
the port from a host." We disagree. In general, the broadest reasonable
interpretation of a connectionless communication is a communication
without prior arrangement. Here, we find that Schuba's SYN packets (i.e.,

communication requests) can reasonably be seen as connectionless datagrams.

For example, Schuba monitors the number of SYN packets flooding to a victim's machine, as TCP connection requests are initiated with a SYN packet (FF 1a). The Examiner interprets the SYN-RECVD state as a connectionless datagram (Ans. 8), because a connection has not yet been established (i.e., connection requests). We agree.

In Schuba, when the maximum number of half-open connections per port is reached, all further incoming connection requests are discarded until the number of half-open connections are cleared (FF 1b). Schuba further discloses a half-open backlog queue (FF 1c). Thus, we find that Schuba discloses determining the number of connectionless datagrams already queued at a port, discarding the datagrams if a maximum number is reached, and queuing the half-open connections if not.

The Examiner finds "[c]ounting and limiting the half-open connections is the same as determining if the connectionless datagram exceeds a prescribed threshold, [where] the limit is the 'prescribed threshold.'" (Ans. 9). We agree.

Thus, Appellants have not persuaded us of error in the Examiner's conclusion of anticipation for representative claim 1. Therefore, we affirm the Examiner's § 102 rejection of independent claim 1 and of claims 3, 5, and 14, which fall therewith.

Claims 2, 4, and 6

Issue 2: Did the Examiner err in finding that the prior art teaches or suggests "calculating the prescribed threshold by multiplying a percentage by the number of available queue slots for the port," as recited in claim 2?

Appellants contend "Yavatkar nowhere teaches or suggests that calculating the average queue length uses a percentage operand in a multiplication operation" (App. Br. 21) (emphasis omitted). Further, Appellants contend "the cited portion nowhere mentions the word 'percentage,' let alone teach or suggest using a percentage as an operand in a multiplication operation." (App. Br. 21). We agree.

Although the Examiner cites column 15, line 63 through column 16, line 17, of Yavatkar, for disclosing the argued limitation of claim 2 (Ans. 13), based on our review of the cited portions, we do not readily find any reference to threshold being calculated based upon a multiplication operation of a percentage of available queue slots. Instead, Yavatkar merely monitors a discard count and how full the buffer is. (Yavatkar, col. 16, ll. 8-16.)

Accordingly, we find the Examiner has erred in finding that the prior art teaches or suggests "calculating the prescribed threshold by multiplying a percentage by the number of available queue slots for the port," as recited in claim 2. Accordingly, we reverse the Examiner's rejection of claim 2, and claims 4, and 6 which stand therewith.

Claims 9 and 12

Issue 3: Did the Examiner err in finding that the prior art teaches or suggests "configuring a maximum number of connectionless datagrams to be queued at the port," as recited in claim 9?

Appellants argue that the cited art does not disclose any thresholds levels, such as maximum or minimum and does not relate to any queuing operations (App. Br. 28). We disagree.

The Examiner cites column 12, lines 27-39 of Yavatkar, for disclosing altering settings for a port (Ans. 15; FF 2a). Furthermore, Schuba discloses setting a maximum number of half-open connections per port (FF 1b).

Accordingly, the combination of Yavatkar and Schuba teach and suggest configuring a port, specifically, configuring a maximum number of half-open (*i.e.*, connectionless datagrams) to a port.

As such, Appellants have not persuaded us of error in the Examiner's conclusion of obviousness for claim 9. Therefore, we affirm the Examiner's § 103 rejection of claim 9 and of claim 12, which falls therewith.

Claims 10 and 13

Issue 4: Did the Examiner err in finding that the prior art teaches or suggests "configuring a controlling percentage of available queue slots remaining for the port," as recited in claim 10?

The Examiner finds "claim 10 is taught in Yavatkar col. 12, lines 27-39," where the agent may alter settings on a port (Ans. 15).

Appellants argue "[t]he cited portion of Yavatkar differs from the claimed feature because the cited portion does not relate to available queue slots for a port, let alone teach or suggest configuring a controlling percentage of available queue slots remaining for the port" (App. Br. 32-33) (emphasis omitted). We agree with Appellants.

The cited portion of Yavatkar merely discloses that the settings for the port can be altered. However, without more of an explanation from the Examiner to correlate the teachings of Yavatkar to the claimed "controlling percentage of available queue slots," we do not see how the cited portions of column 12 of Yavatkar correspond to a "threshold is based on the controlling percentage of available queue slots" as recited in claim 10.

Thus, we find the Examiner has erred in finding that the prior art teaches or suggests "configuring a controlling percentage of available queue slots remaining for the port," as recited in claim 10. Accordingly, we reverse the Examiner's rejection of claim 10, and claim 13, which stands therewith.

Claim 11

Issue 5: Did the Examiner properly combine Schuba and Yavatkar without changing the principle operation of Schuba?

Regarding the specific limitations in claim 11, Appellants merely argue that Schuba fails to teach the limitations of claim 1, from which claim 11 depends (App. Br. 34). Thus, Appellants have chosen to let claim 11 fall

or stand with claim 1. For at least the reasons noted *supra* regarding claim 1, we affirm claim 11.

Appellants further argue that one of ordinary skill in the art would not have been motivated to modify Schuba with Yavatkar, because Schuba already possesses the advantage proposed by the Examiner (*i.e.*, to gain information needed to diagnose a network attack) (*see* App. Br. 23) and "Yavatkar changes the principle operation of Schuba by teaching the use of mobile software modules that move between nodes of a network, while Schuba's system relies on a monitoring program that fixedly resides on one or more processing units" (App. Br. 26) (emphasis omitted).

The Examiner finds that "[o]ne of ordinary skill in the art would have been motivated to perform such a modification in order to gain information needed to diagnose a network attack" and that "there exists a need for a system and method allowing for the distributed state of a network[,] such as information about attack traffic, to be quickly and accurately collected." (Ans. 5; *see also* Final Rej. 7). We agree.

The Supreme Court has held that in analyzing the obviousness of combining elements, a court need not find specific teachings, but rather may consider "the background knowledge possessed by a person having ordinary skill in the art" and "the inferences and creative steps that a person of ordinary skill in the art would employ." *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). Furthermore, in analyzing whether it would have been obvious to one of ordinary skill in the art to make a modification or combination, there does not have to be an express teaching, suggestion, or motivation (TSM) in a published article or issued patent. *KSR*, 550 U.S. at

419 ("The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents.").

Here the Examiner has provided an articulated reason, with rational underpinnings, (*see* Ans. 5 and 16) as to why one of ordinary skill in the art would combine the teachings of the applied art (*e.g.*, (1) to gain information needed to diagnose a network attack and (2) because of the need for a system and method allowing for the distributed state of a network, such as information about attack traffic, to be quickly and accurately collected). Thus, we find that the Examiner has provided sufficient motivation for combining Schuba and Yavatkar.

We have also considered Appellants' arguments that combining Yavatkar with Schuba would render Schuba inoperable, and find them unpersuasive.

If a proposed modification would render the prior art invention being modified inoperable or unsatisfactory for its intended purpose, then the Examiner has failed to make a prima facie case of obviousness. *In re Gordon,* 733 F.2d 900, 902 (Fed. Cir. 1984). However, merely showing alternative methods, is not the same as making inoperable or unsatisfactory. Here, we find that Schuba and Yavatkar merely disclose alternative methods for monitoring traffic on the network.

For example, Schuba teaches that the monitoring resource 51 may be a distributed system having multiple units. Similarly, Yavatkar teaches monitoring a network using mobile software modules that have the

"capability to move from node to node on a network and to execute on the nodes to which it moves" (FF 2b.). While combining the methods may create some redundancy, Appellants have not shown that it will make Schuba's system inoperative.

As such, Appellants have not persuaded us of error in the Examiner's conclusion of obviousness for claim 11. Therefore, we affirm the Examiner's § 103 rejection of claim 11.

DECISION

The Examiner's rejection of claims 1, 3, 5, and 14 under 35 U.S.C. § 102(e) as being anticipated by Schuba is affirmed.

The Examiner's rejection of claims 2, 4, 6, 10, and 13 under 35 U.S.C. § 103(a) as being obvious over Schuba and Yavatkar is reversed.

The Examiner's rejection of claims 9, 11, and 12 under 35 U.S.C. § 103(a) as being obvious over Schuba and Yavatkar is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2009).

AFFIRMED-IN-PART

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